MILNE POINT UNIT

APPLICATION FOR THE ELEVENTH REVISION OF THE KUPARUK PARTICIPATING AREA

FINDINGS AND DECISION OF THE COMMISSIONER
ALASKA DEPARTMENT OF NATURAL RESOURCES

November 24, 1999

MILNE POINT UNIT

ELEVENTH REVISION OF THE KUPARUK
PARTICIPATING AREA

I. INTRODUCTION AND BACKGROUND

BP Exploration (Alaska), Inc. (BP), as Milne Point Unit Operator, applied to expand the Milne Point Unit (MPU) Kuparuk Participating Area (KPA). BP's application, if approved, would result in the eleventh revision to the KPA and add approximately 2,342 acres from ADLs 25509, 25515, 355017, 355016, and 388235 to that participating area. BP submitted geological, well, and production data that justifies the expansion of the KPA within this portion of the MPU. The data indicate that the Kuparuk River Formation within the proposed expansion area is capable of producing or contributing to the production of hydrocarbons in paying quantities.

The State of Alaska Department of Natural Resources, Division of Oil and Gas ("Division") approves BP's application to revise the KPA. The KPA revision encompasses an area that is "reasonably known to be underlain by hydrocarbons and known or reasonably estimated ...to be capable of producing or contributing to production of hydrocarbons in paying quantities." 11 AAC 83.351(a). The Division also approves a revision to Exhibit C to the MPU Agreement (entitled Tract Allocation Schedule), dated October 6, 1999 (Attachment 2 to this Findings and Decision). The effective date of the Eleventh KPA revision and the revised Exhibit C is March 1, 1998.

II. APPLICATION FOR THE ELEVENTH REVISION OF THE KUPARUK PARTICIPATING AREA

BP applied to expand the existing KPA on September 14, 1999. BP submitted the application under 11 AAC 83.351 and Articles 11 and 12 of the MPU Agreement. BP applied to add portions of ADL 25509 (Tract 10), ADL 25515 (Tract 12), ADL 355017 (Tract 15), ADL 355016 (Tract 19), and ADL 388235 (Tract 22), totaling approximately 2,342 acres, to the KPA. The proposed KPA expansion acreage encompasses the Kuparuk Reservoir within the Kuparuk River Formation in the northern and western parts of the MPU. The portions of leases proposed for inclusion in an eleventh revision to the KPA and the proposed tract allocation schedule for all the leases in the KPA listed in Attachment 1 and 2, respectively, to this Findings and Decision.

Geologic evidence supports expansion of the KPA to develop the Kuparuk River Formation reservoirs within the MPU under a unified plan of development. All of the expansion acreage is capable of production or contributing to production in paying quantities. BP conducted tract operations on Tracts 19 and 22 to evaluate the extent of the Kuparuk River Formation. BP drilled four Kuparuk development wells in Tract 19 (one producer and three water injectors) and two on Tract 22 (two producers). Development plans for Tract 22 include water injection

support for the L-40 and F-80 producers and possibly another producer. Production from the expansion area began in March 1998 with MPF-34. Production from the expansion area currently averages approximately 1400 BOPD.

Pursuant to Article 11 of the MPU Agreement, the effective date of any revision to the KPA shall be the first of the month in which knowledge or information is obtained on which the revision is predicated. A more appropriate date may be used if justified by the Unit Operator and approved by the Division Director. BP requested that an eleventh revision to the KPA be effective on the first day of the month after the filing of the expansion application, that is October 1, 1999.

III. DISCUSSION OF THE PARTICIPATING AREA DECISION CRITERIA

The commissioner may approve expansion of a participating area (PA) if it is determined that expansion is "necessary or advisable to protect the public interest." AS 38.05.180(p), 11 AAC 83.303(c) and 11 AAC 83.351(c). Approval of BP's application must be based on the criteria in 11 AAC 83.303(a) and the factors enumerated in 11 AAC 83.303(b).

The commissioner will approve a proposed expansion of a PA or a proposed production or cost allocation formula if the commissioner finds that each requested approval is necessary or advisable to protect the public interest. AS 38.05.180(p), 11 AAC 83.351(c), 11 AAC 83.371(a), and 11 AAC 83.303(a), (c). To find that any or all of the requested approvals are necessary or advisable to protect the public interest, the commissioner must find that the requested approvals will: (1) promote the conservation of all natural resources; (2) promote the prevention of economic and physical waste; and (3) provide for the protection of all parties of interest, including the state. 11 AAC 83.303(a). The commissioner must consider: (1) the environmental costs and benefits; (2) the geological and engineering characteristics of the potential hydrocarbon accumulation or reservoir(s) proposed for inclusion in the participating area; (3) prior exploration activities on the acreage proposed for inclusion in the participating area; (4) the applicant's plans for exploration or development of an expanded participating area; (5) the economic costs and benefits to the state; and (6) any other relevant factors (including mitigation measures) the commissioner determines necessary or advisable to protect the public interest. 11 AAC 83.303(b).

A PA may include only land reasonably known to be underlain by hydrocarbons and known or reasonably estimated through use of geological, geophysical, or engineering data to be capable of producing or contributing to the production of hydrocarbons in paying quantities. 11 AAC 83.351(a). "Paying quantities" means:

> quantities sufficient to yield a return in excess of operating costs, even if drilling and equipment costs may never be repaid and the undertaking as a whole may ultimately result in a loss; quantities are insufficient to yield a return in excess of operating costs unless those quantities, not considering the costs of transportation and marketing, will produce sufficient revenue to induce a prudent operator to

produce those quantities.

11 AAC 83.395(4).

(A) Promote the Conservation of Natural Resources

The formation of oil and gas units, as well as the creation and expansion of PAs within units generally conserve hydrocarbons; coordinated development of leases held by diverse parties maximizes total hydrocarbon recovery and minimizes waste. Thus, an expansion of the existing KPA to encompass the new acreage will provide for more efficient, integrated development of the entire Kuparuk Reservoir within the MPU. A comprehensive operating agreement and plan of development governing the expanded area will help avoid duplicative development efforts on and beneath the surface.

Furthermore, producing hydrocarbon liquids from the expansion area through the existing production and processing facilities will reduce the incremental environmental impact of the additional production. The oil and gas resources of the expansion area can be accessed by wells from preexisting drill pads and processed through preexisting facilities. Expanding the KPA will maximize oil and gas recovery, while minimizing negative impacts on all other natural resources within the area.

(B) Prevention of Economic and Physical Waste

Generally, the formation and expansion of a PA facilitates the equitable division of costs and allocation of hydrocarbon shares, and provides for a diligent development plan which maximizes physical and economic benefit from a reservoir's production. Further, the creation and subsequent expansion of a PA which enables both facility sharing and adoption of a unified reservoir management strategy may allow economically marginal hydrocarbon accumulations to be developed that otherwise might not be.

Expanding the KPA improves the likelihood of more complete development of a reservoir with variable productivity across adjoining leases. Using the existing KPA infrastructure and facilities eliminates the need to construct stand-alone facilities to process the additional volume of recoverable hydrocarbons from the expansion area. The Division encourages the shared use of major processing facilities to minimize any additional surface impacts and costs. The Division allows commingled production through the existing MPU facilities and approved a well test-based production allocation methodology for current and future reservoirs sharing those facilities. The methodology is subject to periodic review and reconsideration to assure that the state's royalty, tax, and other interests are protected.

Further, facility consolidation saves capital and promotes better reservoir management through pressure maintenance and enhanced recovery procedures. In combination, these factors allow the Kuparuk Reservoir to be developed and produced in the interest of all parties, including the State. Expanding the KPA to include the leases that contain productive Kuparuk Formation

reservoirs allows these expansion areas to access existing drill pads and unit facilities and prevents economic and physical waste.

(C) Protection of All Parties

Because hydrocarbon recovery will be maximized and additional production-based revenue will be derived from the additional KPA production, the state's economic interest is promoted. Diligent exploration under a single approved unit plan without the complications of competing leasehold interests promotes the state's interest. The expansion of the KPA promotes efficient evaluation and development of the state's resources, yet minimizes impacts to the area's cultural, biological, and environmental resources. Operating under the MPU Agreement provides for accurate reporting and record keeping, royalty settlement, in kind taking, and emergency storage of oil. These all protect the state's interest.

The proposed expansion of the KPA protects the economic interests of all working interest owners of the reservoirs in the PA, and the royalty owner. Combining interests and operating under the terms of the MPU Agreement and MPU Operating Agreement assure each individual working interest owner an equitable allocation of costs and revenues commensurate with the resources of its lease(s).

In reviewing the above criteria, the following factors were considered:

1) The Environmental Costs and Benefits

As discussed above in section III (A), the sharing of the existing facilities eliminates duplication and minimizes the surface area affected by additional development. All of the wells in the proposed expansion area have been developed from existing drill pads and MPU infrastructure. All future development of the expansion area will take place from existing drill pads and infrastructure. No significant additional impacts to nearshore and onshore habitat or biological resources are anticipated because of the additional Kuparuk production from an expanded KPA.

(2) The Geological and Engineering Characteristics, and Previous Exploration of the Proposed Expansion Area

The MPU lies adjacent to the northeast side of the Kuparuk River Unit (KRU). The overall structure of the MPU area is a faulted, northwest plunging anticline that breaks up the area into isolated fault blocks with varying oil/water contacts. Within the MPU, the Kuparuk River Formation is cut by two major bisecting fault systems; one fault system strikes northwest-to-southeast; the other fault system trends north-northeast to south-southwest. Fault throw is variable; major faults have throws in the range of 150 to 350 feet. There are numerous smaller faults in the area with throws on the order of 10 to 100 feet. The area produces oil from three geologic formations: 1) the Upper Triassic Sag River Formation; 2) the Lower Cretaceous Kuparuk River Formation; and 3) the Upper Cretaceous Schrader Bluff Formation. The Eleventh KPA expansion involves reservoirs contained within the Kuparuk River Formation.

The Kuparuk River Formation is subdivided into four major informal members that are designated with letters A through D. The 'A' member is the oldest and the 'D' member is the youngest. Each member is further subdivided into submembers that are designated with numbers, such as C-1 and B-7 (with one being the oldest sub unit). The 'C' and 'B' members are separated by a major unconformity, the Lower Cretaceous Unconformity (LCU).

Upon request by the division, BP submitted the following confidential geological, geophysical, and engineering data in support of the Eleventh KPA expansion application.

1) A MPU KPA expansion base map at the scale of 1:4000.
2) Location map – illustrating locations of the seismic lines submitted in support of the Eleventh KPA expansion at the scale of 1"= 1 mile.
3) Two sets of intersecting representative seismic lines over the proposed expansion area.
4) Top 'A' sandstone structure map at the scale of 1:24000.
5) Fault map over the western part of the MPU including the proposed expansion area at the scale of 1:24000.
6) A Kuparuk River Formation fault map of the acreage within the expansion area with individual oil/water contacts displayed for each fault block at the scale of 1:24000.
7) Fourteen representative annotated key well logs illustrating the stratigraphy in the area around and within the proposed expansion area (scale of 2" = 100'). The list of key well logs provided by BP includes: NMilne-01, MPF-05, MPF-17, MPF-34, MPF-41, MPF-80, MPF-84, MPF-92, MPL-03, MPL-17, MPL-20, MPL-28A, MPL-39, and MPL-40.
8) Net sand maps over the western part of the MPU at the scale of 1:2400 for the various Kuparuk intervals.
9) Methodology and supporting spreadsheet data to explain how BP arrived at reserve calculations and tract allocations.

Kuparuk reserves have been developed from 157 wells drilled on seven pads. Currently 90 Kuparuk producers yield approximately 49,000 bopd. Six wells have been drilled within 180 acres of the proposed expansion area. These wells are MPL-02 on Tract 10, MPL-17 on Tract 10 and Tract 12, and MPF-84, MPF-05, MPL-03, and MPL-28A on Tract 22. In addition, six wells have been drilled within the proposed expansion tracts. The wells are MPF-41 on Tract 15, MPF-17, MPF-34, and MPF-92 on Tract 19, and MPL-40, and MPF-80 on Tract 22.

The Kuparuk 'A' Sandstone submembers A-1, A-2, and A-3 constitute the primary reservoir pay zones in the proposed Eleventh KPA expansion area. The Kuparuk 'B' sandstone members are potentially important contributors to production in localized areas of the expansion area. Possible upside potential exists in the Kuparuk 'C' sandstone. The major fault blocks within the MPU area contain separate oil/water contacts. In general, the oil/water contacts become deeper to the northwest. The northern portion of the proposed expansion area is the downdip portion of fault blocks already included in the KPA. The proposed Tract 22 expansion area extends into newly drilled fault blocks between the Northwest Milne deep oil–water contact area and the L-Pad shallower oil-water contact area which was added to the KPA with the Tenth KPA expansion.

The areas proposed for the eleventh KPA expansion are consistent with the Top 'A' Sand Structure Map and the oil/water contacts observed in the wells within and surrounding the expansion acreage. The information provided to the division demonstrate that the proposed expansion area is known to be underlain by hydrocarbons and is reasonably estimated to be capable of contributing to hydrocarbon production in paying quantities from the Kuparuk A sandstones. In addition, there is some upside potential in the proposed expansion area for pay within the 'B' and 'C' sandstone intervals.

(3) The Applicant's Plan for Exploration or Development of the Expanded Participating Area

Plans for the development of the expansion area and areas adjacent to the expansion area include the continued use of F-Pad and L-Pad. Future development plans include four wells per year for the next four years. These wells will be predominately infill and sidetrack wells. Presently, not all of the land in Tract 22 is developed on 160-acre spacing. Injection support for MPL-40 and MPF-80 and possibly another producer are planned for Tract 22 in 2000.

(4) The Economic Costs and Benefits to the State

Approval of the proposed KPA expansion will provide economic benefits to the state by including the area in the MPU Kuparuk reservoir plan of development, which proposes to maximize the physical and economic recovery of hydrocarbons from the Kuparuk reservoir. Maximum hydrocarbon recovery will enhance the state's long-term royalty and tax revenues.

Any additional administrative burdens associated with the proposed revised KPA are far outweighed by the additional royalty and tax benefits derived from the expansion area production.

(5) Any Other Relevant Factors

Pursuant to 11 AAC 83.351 and 11 AAC 83.371, BP submitted with the application an allocation of production and cost for the leases in the proposed KPA expansion area (Attachment 2 to this Findings and Decision and revised Exhibit C to the MPU Agreement). The proposed tract allocation schedule distributes working interest equity among the leases according to original recoverable reserves. The basis of the tract allocation schedule--recoverable reserves--is consistent with previous revisions of the KPA. Division staff agrees with BP's estimate of recoverable reserves from the expansion area tracts, and the Division finds BP's tract allocation methodology acceptable for allocating production and costs among the leases in the expanded KPA.

Article 11 of the MPU Agreement mandates that the effective date of any revision to the KPA shall be the first of the month in which knowledge or information is obtained on which the revision is predicated. Production from the proposed expansion area commenced during the month of March 1998. A more appropriate date may be used if justified by the Unit Operator

and approved by the Division Director. BP requested that an eleventh revision to the KPA be effective on the first day of the month after the filing of the expansion application, that is October 1, 1999. BP did not provide a basis for this date.

In previous KPA expansion applications, the agreed to effective date of the KPA revision and revised KPA tract allocation schedule has been the first day of the month in which production commenced from the proposed expansion area with a well specific tract operation. This date is consistent with the language of Article 11 of the MPU Agreement.

Of the six wells drilled into the proposed expansion area, three wells, F-34, F-80, and L-40, are production wells. Division records indicated that the earliest production from the expansion area commenced from the F-34 tract operation during March 1998. Based on this information and Article 11 of the MPU Agreement, the Division determines that the effective date of the proposed expansion and revised tract allocation schedule shall be March 1, 1998.

IV. FINDINGS AND DECISION

Based on the facts discussed in this document and the administrative record, I make findings and impose conditions as follows:

1. The well(s) in the Kuparuk River Formation reservoirs within the area proposed for the eleventh KPA revision are certified as meeting the paying quantities test. The acreage is underlain by hydrocarbons and known and reasonably estimated to be capable of production or contributing to production in sufficient quantities to justify the expansion of the KPA within the MPU.

2. The geological and engineering data justify the inclusion of the proposed tracts within the KPA. Under the terms of the applicable regulations governing formation and operation of oil and gas units (11 AAC 83.301 - 11 AAC 83.395) and the terms and conditions under which these lands were leased from the state, the lands described in Attachment 1 to this Findings and Decision are to be included in the KPA.

3. The KPA expansion provides for the equitable division of costs and an equitable allocation of produced hydrocarbons, and sets forth a development plan designed to maximize physical and economic recovery from the reservoirs within the expanded and approved participating areas. The allocations of production and costs for the tracts within the KPA (revised Exhibit C), Attachment 2 to this Findings and Decision, are approved.

4. The production of KPA hydrocarbon liquids through the existing production and processing facilities within the MPU reduces the environmental impact of the additional production. Utilization of existing facilities will avoid unnecessary duplication of development efforts on and beneath the surface.

5. The MPU Owners plan diligent exploration and delineation of the reservoirs underlying the MPU under approved plans of development and operation.

6. Approval of the eleventh expansion of the KPA, and the revised Exhibit C to the MPU Agreement (Attachment 2 to this Findings and Decision) are effective retroactive to March 1, 1998.

For these reasons and subject to the conditions and limitations noted, I hereby approve the Eleventh Revision of the Kuparuk Participating Area within the Milne Point Unit.

Kenneth A. Boyd, Director
Division of Oil and Gas

24 Dec 1999
Date

For: John Shively, Commissioner
Alaska Department of Natural Resources

Attachments: Attachment 1: Eleventh KPA Revision Tracts
Attachment 2: Revised Exhibit C to the MPU Agreement (KPA Tract Allocation Schedule)

MPU.11thKPA.Rev.doc

Attachment 1
MILNE POINT UNIT
11TH KUPARUK PA REVISION

KPA Expansion Land and Lease Description

MPU Tract	ADL Lease #	Umiat Meridian	Sections	Acres	Total Acres
10	25509	T13N-R10E	Sec. 7: SW/4, W/2 SE/4	234	234
12	25515	T13N-R10E	Sec.18: NW/4 NE/4	40	40
15	355017	T14N-R10E	Sec. 28: NE/4 NW/4	40	40
19	355016	T14N-R10E	Sec. 17: S/2 SW/4, SW/4 SE/4	120	908
			Sec. 18: S/2 SE/4	80	
			Sec. 19: N/2	308	
			Sec. 20: NW/4, W/2 NE/4	240	
			Sec. 21: SW/4	160	
22	388235	T13N-R10E	Sec. 1: SW/4 SW/4	40	1,120
			Sec. 2: SE/4, SW/4 NE/4, S/2 NW/4, NW/4 NW/4	320	
			Sec. 11: NE/4	160	
			Sec. 12: NW/4, SW/4, SE/4, S/2 NE/4, NW/4 NE/4	600	
				Total Additions	2,342

MILNE POINT UNIT AGREEMENT
KUPARUK PARTICIPATING AREA

PRL :D EXHIBIT C
TRACT PARTICIPATION FACTORS

MPU Tract #	ADL Lease #	Umiat Meridian	Acres	Sections	Tract Participation %	BPAE/BPOE Royalty %	OXY Royalty %	Net Profit Share %
2	47433	T13N-R10E	2,240	Sec. 1: S/2; Secs. 2, 11, 12	1.87794%	20.0	12.5	
3	47434	T13N-R10E	2,560	Secs. 3, 4, 9, 10	8.39878%	20.0	12.5	
4	25516	T13N-R10E	640	Sec.15	0.54079%	12.5	12.5	
4A	315848	T13N-R10E	1,280	Secs. 16, 21	2.12296%	12.5	12.5	
5	47437	T13N-R10E	2,480	Secs. 13, 14, 24 Sec. 23: N/2, SE/4, E/2 SW/4	5.98459%	20.0	12.5	
6	47438	T13N-R11E	1,424	Sec. 19 Sec. 18: W/2 W/2, NE/4 NW/4, NW/4 NE/4, E/2 SW/4, S/2 SE/4 Sec. 20: SW/4, W/2 NW/4, SE/4 NW/4, W/2 SE/4, SE/4 SE/4	1.67350%	20.0	12.5	
8	28231	T13N-R11E	2,277	Secs. 29, 30 Sec. 31: NE/4, N/2 SE/4, NW4 Sec. 32: E/2, NW/4, E/2 SW/4, NW/4 SW/4	3.26071%	12.5	12.5	
9	25518	T13N-R10E	800	Sec. 25 Sec. 26: E/2 NE/4 Sec. 36: E/2 NE/4	0.41153%	12.5	12.5	
10	25509	T13N-R10E	2,533	Secs. 5, 6, 7, 8: All	4.85558%	12.5	12.5	
11	25514	T13-R9E	2,400	Sec. 13, 23 Sec. 14: W/2, SE/4, W/2 NE/4, SE/4 NE/4 Sec. 24: W/2, W/2 NE/4, NE/4 NE/4, W/2 SE/4	13.50666%	12.5		
12	25515	T13N-R10E	1,360	Secs. 17, 20 Sec. 18: N/2 NE/4	1.71402%	12.5	12.5	
14	25906	T13N-R10E	600	Sec. 27: W/2 NW/4, NW/4 SW/4 Sec. 28: N/2, N/2 SW/4, N/2 SE/4	1.94974%	12.5	12.5	
15	355017	T14N-R10E	3,440	Secs. 32, 33, 34 Sec. 27: S/2 SW/4 Sec. 28: SW/4, NW/4, W/2 SE/4, SE/4 SE/4 Sec. 29: All Sec. 35: SW/4, S/2 NW/4, W/2 SE/4, SE/4 SE/4	9.36215%	12.5	12.5	40
16	355018	T14N-R9E T14N-R10E	4,402	Secs. 25, 26, 35, 36 Sec. 27: E/2, E/2 SW/4, SE/4 NW/4 Sec. 34: N/2 NE/4, NW/4 NE/4, NE/4 SE/4 Secs. 30, 31	23.25814%	12.5	12.5	30
18	355021	T14N-R9E	1,080	Sec. 22: SE/4 SE/4 Sec. 23: SE/4, S/2 SW/4, NE/4 SW/4, S/2 NE/4, NE/4 NE/4 Sec. 24: All	2.44407%	12.5	12.5	30
19	355016	T14N-R10E	1,537	Sec. 17: S/2 SW/4, SW/4 SE/4 Sec. 18: S/2 SE/4 Sec. 19: All Sec. 20: S/2, NW/4, W/2 NE/4 Sec. 21: SW/4	6.54762%	12.5	12.5	40
22	388235	T13N-R9E	1,920	Sec. 1: All Sec. 2: N/2, SE/4 Sec. 11: NE/4 Sec. 12: All	6.17073%	12.5	12.5	30
23	380109	T12N-R10E	480	Sec. 1: E/2; Sec. 12: NE/4	0.26018%	12.5	12.5	
24	380110	T12N-R11E	180.5	Sec. 6: W/2 NW/4, W/2 SW/4 Sec. 7: NW/4 NW/4	0.03508%	12.5	12.5	
25	375133	T12N-R11E	1,120	Sec. 3: All Sec. 4: E/2 Sec. 10: N/2 NW/4, N/2 NE/4	1.27955%	12.5	12.5	
26	375132	T12N-R11E	1,000	Sec. 1: W/2 NW/4, W/2 SW/4 Sec. 2: All Sec. 11: N/2 NW/4, N/2 NE/4 Sec. 12: NW/4 NW/4	1.53673%	12.5	12.5	
27	28232	T13N-R11E	800	Sec. 27: None Sec. 28: S/2 SW/4 Sec. 33: W/2, SE/4, S/2 NE/4, NE/4 NE/4 Sec. 34: W/2 NW/4, NW/4 SW/4	0.80895%	12.5	12.5	
			36,553.0		100.00000%			

Attachment 2